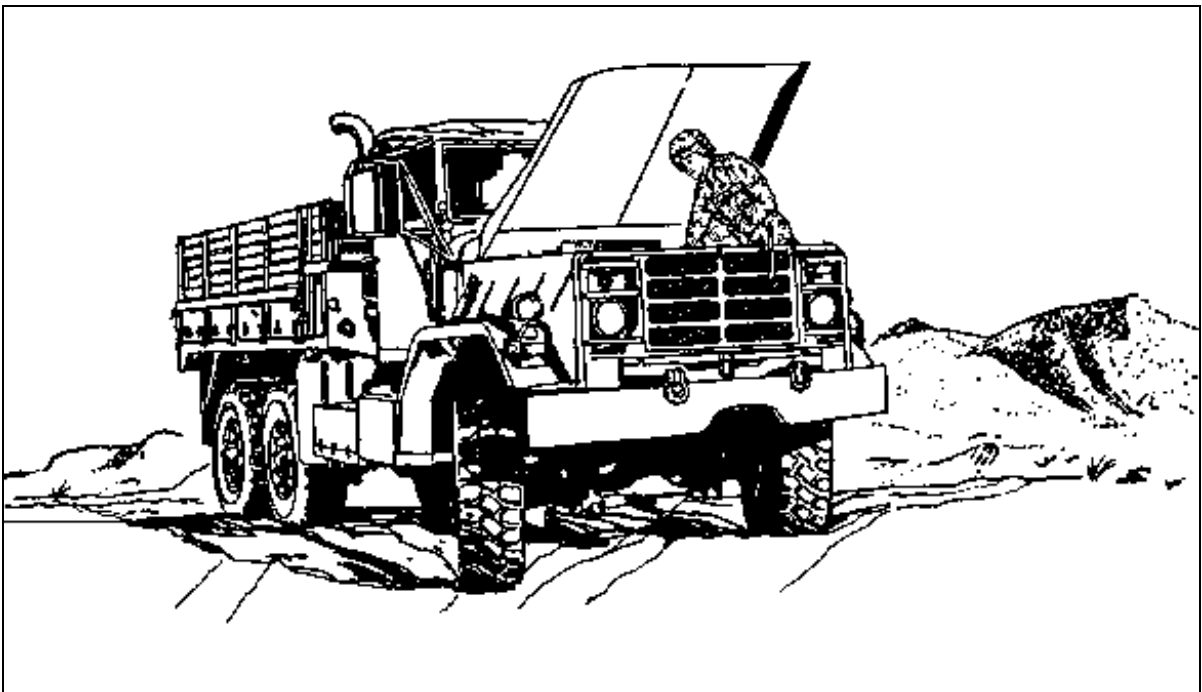


## Chapter 1

# Fundamentals

Global interdependence, reduced time, and fast-changing technology affect every aspect of how the Ordnance Corps must do business today and into the twenty-first century. In a force-projection Army, maintenance elements are increasingly required to anticipate, analyze, and tailor available resources for effective, timely support of complex weapon systems. Today's focus on adaptive planning to provide increased options for decision makers is prompting maintenance managers to embrace change, innovation, and flexibility at all levels. Success will continue to be based on the bottom-line measurement of how well our customers' equipment remains operational (availability), how quickly it can be returned to service when it becomes inoperable (maintainability), and how long the user can anticipate failure-free performance (reliability). Sustaining decisive land force dominance through synchronized maintenance operations will challenge commanders at all levels. They must understand customer requirements, the overall support concept, and the Army maintenance system to have the right capabilities in the right place at the right time.



**SECTION I – MAINTENANCE**

1-1. Maintenance is one of the six combat service support functions that support soldiers and their systems in the field. It sustains materiel in an operational status, restores it to serviceable condition, or upgrades its functional utility through modification or product improvement. The Army maintenance system designates the scope of tasks performed by maintenance activities. It provides support planning requirements for maintenance of materiel systems when fielded and after fielding, and it establishes requirements for managing activities that physically perform maintenance.

1-2. Maintenance levels form the baseline for determining which specific maintenance tasks are assigned to each level. They are a means to select the scope of maintenance and the skill levels necessary for units and activities at various command levels.

1-3. Maintenance tasks include any action that retains or restores materiel to a fully mission-capable condition. Tasks range from simple preventive maintenance checks and services (PMCS) of equipment to complex depot operations performed in fixed shop facilities. The maintenance allocation chart remains the primary tool for assigning tasks.

**THE ARMY MAINTENANCE SYSTEM**

1-4. Effective management of the Army maintenance system depends on a smoothly functioning organization from the national to the unit level. Highly complex maintenance operations are performed at depot level while units perform simple PMCS operations.

**MAINTENANCE LEVELS**

1-5. The Army maintenance system, less aircraft, consists of a flexible, four-level system (Figure 1-1). Each unique level makes a different contribution to the overall system (Figure 1-2).

MAINTENANCE LEVEL	CATEGORY
Unit	Operator/crew Operator/Maintainer Organizational
Direct Support (DS)	Direct Support
General Support (GS)	General Support
Depot	Depot

**Figure 1-1. The Four Levels of Maintenance**

LEVEL OF MAINTENANCE	DESCRIPTION
Unit	<ul style="list-style-type: none"> <li>• Foundation of the maintenance system; requires continuous emphasis by commanders.</li> <li>• Repairs made by operator/crew as well as mechanics assigned to organization.</li> <li>• Operator/crew is cornerstone; they perform PMCS IAW applicable operator's series (-10 level) technical manual (TM).</li> <li>• TM 20-series PMCS tables used to perform scheduled PMCS services to sustain and extend combat-capable life of equipment.</li> <li>• Repairs on certain equipment completed by operator/maintainer. Operator performs checks, services, and maintenance prescribed in both -10 and -20 level TMs.</li> </ul>
DS	<ul style="list-style-type: none"> <li>• One-stop service to supported customers.</li> <li>• Highly mobile, weapon-system-oriented maintenance.</li> <li>• Backup support to unit-level maintenance.</li> <li>• Repair and return to the user.</li> <li>• Support provided to dedicated customers or on area basis.</li> </ul>
GS	<ul style="list-style-type: none"> <li>• Commodity-oriented repair of components and end items in support of theater supply system.</li> <li>• Backup maintenance support to DS units.</li> <li>• Job shop/bay or production line operations with capability to task/organize to meet special mission requirements.</li> <li>• Located at echelons above corps (EAC).</li> </ul> <p><b>NOTE:</b> Based on METT-TC, platoon/team-size elements can be found as far forward as required to support the tactical situation.</p>

Figure 1-2. Maintenance Level Descriptions

LEVEL OF MAINTENANCE	DESCRIPTION
Depot	<ul style="list-style-type: none"><li>• Maintenance performed by tables of distribution and allowances (TDA) industrial-type activities operated by the Army.</li><li>• Provides combat-ready materiel to the Army supply system.</li><li>• Repairs and returns to wholesale supply system at national level or, by exception, to theater of operations.</li><li>• Provides technical support and backup to DS and GS maintenance units.</li><li>• In wartime, “warfighter Commander in Chief ” (CINC) assumes control of depot-level maintenance operations in theater of operations.</li></ul>

**Figure 1-2. Maintenance Level Descriptions (Continued)**

**NOTE**

While these are distinct levels, there is flexibility built into the system due to overlapping capabilities. Maintainers do not lock themselves into rigid levels of maintenance. When mission, enemy, terrain, troops, time available, and civilian considerations (METT-TC) permit, maintainers at the various levels may also repair selected components to eliminate higher echelon backlogs and maintain technical skills.



### FORCE XXI AND BEYOND...

Maintenance XXI consolidates the current four levels of maintenance into two levels—field and sustainment.

Field maintenance combines the organizational and direct support levels of maintenance. Field maintenance includes those tasks that are performed “on-system” at the point of breakdown or the point of repair (maintenance collection point). At this level of maintenance, operators and maintainers fix vehicles through the replacement of major system components. Field maintenance is generally performed by soldiers and maintainers assigned to the TOE units. However, when authorized, contractors may provide field maintenance support for low-density, highly technical, cost-prohibitive systems.

Sustainment maintenance combines the general support and depot levels of maintenance. Additionally, sustainment maintenance includes some direct-support-level maintenance tasks. Sustainment maintenance consists of those tasks that are normally performed “off-system.” At this level of maintenance, maintainers focus on the repair of component items and their return to the distribution system. Component repair includes items such as major assemblies (engines, transmissions, etc), line-replaceable units (LRUs), and reparable-type items (starters, generators, fire control, etc). Sustainment maintenance can be performed by corps and theater maintenance activities, special repair activities (SRAa), or by contractors on the battlefield. The theater sustainment maintenance manager coordinates and workloads sustainment maintenance activities.

## LEVELS OF WAR

1-6. Coordination of maintenance operations occurs at all levels of war (Figure 1-3 describes how the four levels of maintenance overlay the levels of war):

- Strategic. Maintenance operations are largely the purview of the depot maintenance level in concert with the continental United States (CONUS) based industrial and civilian sector. Maintenance management primarily links the nation’s economic base (people, resources, and industry) to its military operations in theaters.
- Operational. Maintenance operations link strategic capabilities to tactical requirements. Managers coordinate DS and GS maintenance, specialized/forward repair activities, and base logistics operations. At this level, the maintenance system both drives and supports the supply system. DS maintenance works to meet tactical requirements, while GS maintenance provides commodity-oriented repair of

components and end items to support the theater supply system. The primary focus is to maximize the number of operational combat systems available to support the tactical battle.

- **Tactical.** Maintenance operations consist of activities required to keep weapon systems operational during battle, supporting the tactical commander's scheme of operation. Managers oversee operator/crew, unit, and DS maintenance operations. The primary focus is equipment repair or replacement and return to user.

LEVEL	UNIT	DIRECT SUPPORT	GENERAL SUPPORT	DEPOT
<b>WHO</b>	<ul style="list-style-type: none"> <li>• Operator</li> <li>• Crew</li> <li>• Unit maintenance personnel</li> <li>• Operator /Maintainer</li> </ul>	<ul style="list-style-type: none"> <li>• DS maintenance units</li> <li>• Installation support maintenance shops</li> <li>• Host nation support</li> </ul>	<ul style="list-style-type: none"> <li>• GS maintenance units</li> <li>• Specialized repair activities (SRAs)</li> <li>• Installation support maintenance shops</li> <li>• Host nation support</li> </ul>	<ul style="list-style-type: none"> <li>• Predominately Army Materiel Command (AMC)</li> <li>• Commercial contractors</li> <li>• Host nation support</li> </ul>
<b>WHERE</b>	<ul style="list-style-type: none"> <li>• Breakdown site</li> <li>• Equipment location</li> <li>• Unit maintenance areas</li> <li>• Unit maintenance collection point (UMCP)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile maintenance shops</li> <li>• Fixed shops in installations/ units</li> <li>• Equipment location/ breakdown site/ UMCP</li> <li>• Division, corps, and EAC maintenance collection points (MCPs)</li> </ul>	<ul style="list-style-type: none"> <li>• Fixed/semi-fixed maintenance facilities</li> <li>• Installation maintenance shops</li> <li>• Equipment location</li> <li>• EAC</li> </ul>	<ul style="list-style-type: none"> <li>• Fixed plant-type facilities</li> <li>• On site, on exception</li> <li>• CONUS and selected theaters</li> </ul>
<b>WHAT</b>	<ul style="list-style-type: none"> <li>• PMCS</li> <li>• Inspections by sight and touch</li> <li>• Lubricating, preserving, cleaning, replacement, and minor adjustments authorized by maintenance allocation chart (MAC)</li> <li>• Diagnosis and fault isolation per MAC</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnose and isolate components and assembly malfunctions</li> <li>• Adjust, calibrate, and align components and assemblies</li> <li>• Replace components, modules, assemblies, and piece parts</li> <li>• Repair defective end items and components</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnose and isolate equipment components and assembly malfunctions to the internal piece level</li> <li>• Adjust, calibrate, align, and repair components and assemblies</li> <li>• Repair/modification of end items/ components and assemblies to the internal piece part level (overhaul)</li> </ul>	<ul style="list-style-type: none"> <li>• Overhaul of components and end items</li> <li>• Repair end items, components, assemblies, and modules to original manufactured tolerances/ specifications (rebuild)</li> <li>• Repair requiring special environmental facilities</li> <li>• Nondestructive testing</li> <li>• Cyclic overhaul and special maintenance programs</li> </ul>

Figure 1-3. Maintenance Level Information

LEVEL	UNIT	DIRECT SUPPORT	GENERAL SUPPORT	DEPOT
WHAT	<ul style="list-style-type: none"> <li>• Replacement of unserviceable parts, modules, and assemblies per MAC</li> <li>• Fault verification and level of repair</li> <li>• Requisition, receipt, storage, and issue of repair parts (PLL)</li> <li>• Recovery and transport operations</li> <li>• Battle damage assessment and repair (BDAR)</li> <li>• Army Oil Analysis Program (AOAP)</li> <li>• Reporting material readiness per AR 700-138</li> </ul>	<ul style="list-style-type: none"> <li>• Operate repair parts supply/reparable exchange activity (RXA)</li> <li>• Recovery</li> <li>• Light body repairs</li> <li>• Technical assistance</li> <li>• BDAR</li> <li>• Apply DS-level modification work orders (MWOs)</li> <li>• DS-level repair /issue operational readiness float (ORF)</li> <li>• Reinforce support to unit level maintenance</li> <li>• Provide maintenance support teams (MSTs)</li> <li>• Estimated cost of damages (ECOD) support</li> <li>• Repair parts supply (shop stock)</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy, body, hull, turret, frame repair</li> <li>• Collection and classification of unserviceable Class VII</li> <li>• Evacuate disposable material</li> <li>• Technical assistance</li> <li>• Backup support to DS units</li> <li>• Operation of cannibalization point</li> <li>• Mobile MSTs</li> <li>• GS-level repair of ORF</li> <li>• Limited recovery</li> </ul>	<ul style="list-style-type: none"> <li>• Manufacture of parts not otherwise available</li> <li>• Technical assistance</li> <li>• Reinforcing support to DS and GS units</li> <li>• Wholesale-level reparable exchange</li> <li>• Restoration</li> <li>• Conversion</li> <li>• Renovation</li> <li>• Parts fabrication</li> <li>• Modification of serviceable assets</li> <li>• Restoration of unserviceables to prescribed levels of serviceability</li> <li>• Inspections/modifications requiring extensive disassembly or elaborate test equipment</li> </ul>
WHY	<ul style="list-style-type: none"> <li>• Support user unit's materiel readiness</li> </ul>	<ul style="list-style-type: none"> <li>• Support using unit materiel readiness</li> </ul>	<ul style="list-style-type: none"> <li>• Support theater supply system by repair and return to supply stocks</li> <li>• Support of local supply stocks, ORF stocks of DS units, and repair and return to user programs</li> </ul>	<ul style="list-style-type: none"> <li>• Support of Army/theater supply inventory by repair and return to supply stocks</li> <li>• Support of user unit's materiel readiness with repair cycle float</li> </ul>

Figure 1-3. Maintenance Level Information (Continued)

**NOTE**

Elements from GS- and depot-level activities can be found as far forward as required to support the tactical situation.

**SUSTAINMENT MAINTENANCE SUPPORT**

1-7. Sustainment maintenance is generally performed above the DS level. It consists of active and reserve GS maintenance units, directors of logistics (DOL), depots, special repair activities (SRAs), forward repair activities (FRAs), and contractors, who can be tailored to meet sustainment maintenance demands anywhere in the world. It is integrated management that focuses on centralized management with decentralized execution of maintenance programs at local, regional, and national levels. It maximizes repair capability while providing high levels of weapon system availability at the least cost.

1-8. Centers of excellence (COE) are established for sustainment activities to determine how maintenance units can best support the theater operations plan. COE support the theater supply system through TOE or TDA units, host nation support, and contract personnel.

**LOCAL SUSTAINMENT MAINTENANCE MANAGER**

1-9. The local sustainment maintenance manager (LSMM) workloads sustainment maintenance units and activities in a designated geographical area that could be at multiple maintenance centers. There may be situations where an LSMM operation is established in an overseas theater of operations as part of the logistics support element (LSE).

**REGIONAL SUSTAINMENT MAINTENANCE MANAGER**

1-10. The regional sustainment maintenance manager (RSMM) at a designated geographical area has the authority to prioritize or redirect workload among the LSMMs. Depending on the extent of support required, an RSMM operation may be established in an overseas theater of operations as part of LSE support.

**NATIONAL SUSTAINMENT MAINTENANCE MANAGER**

1-11. The national sustainment maintenance manager (NSMM) integrates sustainment maintenance for the total Army. The NSMM develops and implements policies and procedures to provide optimal sustainment maintenance support to the full spectrum of total Army missions. The NSMM also participates in developing and integrating the LSE. Support is provided in a seamless process transparent to the user.

**LOGISTICS SUPPORT ELEMENTS**

1-12. Logistics support elements—

- Generally move into fixed or semifixed facilities in the theater, where they remain for the duration of operations.

- Can displace forward, though in a very time-consuming, labor-and equipment-intensive process. However, they can deploy platoons, sections, or teams as far forward as required to support the tactical situation.
- Are attached, when deployed forward, to the nearest maintenance company; all requirements pass through that headquarters.

## **MAINTENANCE ALLOCATION CHART**

1-13. The maintenance allocation chart designates overall authority and responsibility for the performance of maintenance functions on an item of equipment. Figure 1-4 shows a maintenance allocation chart. Figure 1-5 describes the MAC's six columns.

MAINTENANCE ALLOCATION CHART									
1	2	3	4					5	6
Group Number	Component Assembly	Maintenance Function	*Maintenance Level					Tools and Equipment	Remarks
			C	O	F	H	D		
05	COOLING SYSTEM CONT								
0505	Fan Tower Assembly	Inspect		0.2					
		Test		0.2					
		Replace			0.3				A
		Repair		4.5				35	
		Overhaul				**		37	
06	ELECTRICAL								
0601	Alternator	Inspect		0.2					
		Test		0.2					B
		Replace		2.0					
		Repair			8.0				
		Overhaul				**			
0602	Voltage Regulation	Inspect		0.2					
		Test		0.2	0.2				
		Replace		2.0					
		Repair			1.0				
		Overhaul							
0603	Motor Starting	Inspect		0.2					
		Test		0.2					
		Replace		2.0					
		Repair			2.4			48	
		Overhaul				**			
**Worktimes are included in DMWR			*C Operator or crew O Organizational F Direct support maintenance H General support maintenance D Depot maintenance						

Figure 1-4. Maintenance Allocation Chart

<b>Column 1 - Group Number</b>	Lists group numbers, which identify components, assemblies, subassemblies, and modules with the next higher assembly.
<b>Column 2 - Component/Assembly</b>	Contains noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.
<b>Column 3 - Maintenance Function</b>	Lists functions to be performed on items in Column 2. Maintenance functions are limited to, and defined as, those listed in Figure 1-6.
<b>Column 4 - Maintenance Level</b> (Four levels of maintenance with specific tasks divided into five maintenance categories)	Specifies the lowest level of maintenance authorized to perform the function listed in Column 3. Listing a work-time figure in the proper subcolumn does this. The work-time figure represents the man-hours required to perform the function. The number of man-hours specified is the average time required to restore an item to use under field operating conditions, which includes preparation, troubleshooting, and technical inspection/quality control time in addition to the time required to perform the specific task.
<b>Column 5 - Tools and Equipment</b>	Names by code the common tool sets, special tools, and test/support equipment required to perform the designated function.
<b>Column 6 - Remarks</b>	Lists references to the page at the end of the MAC.

Figure 1-5. MAC Columns

## LOCATION

1-14. The MAC is found in equipment technical manuals that contain unit-level (-12, -13, -14, -20, 23, and -24) maintenance procedures. Some recently fielded, highly complex weapon systems have separate manuals for the MAC. In those instances, the technical manual has the same first eight digits as other series technical manuals, followed by "MAC." For example, the MAC for the M1 tank is TM 9-2350-255-MAC.

**OBJECTIVES**

1-15. The Army maintenance system is organized to service and repair equipment throughout its in-service life. Organizations are tailored to provide the required equipment maintenance capability at appropriate levels throughout the maintenance system.

1-16. To ensure balance in the maintenance system, it is important that the responsibilities of each maintenance level be kept in perspective. It is a tactical necessity for user units to perform preventive maintenance. However, users are not expected to perform support or depot maintenance.

**FUNCTIONS**

1-17. Maintenance functions are defined in Figure 1-6.

<b>Title</b>	<b>Description</b>
<b>Inspect</b>	To determine the serviceability of an item by comparing its physical, mechanical, or electrical characteristics with established standards through examination.
<b>Test</b>	To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing with prescribed standards.
<b>Service</b>	To perform maintenance required periodically to keep an item in operating condition.
<b>Adjust/Align</b>	To maintain or regulate an item, within prescribed limits, by bringing it into proper or exact position or by setting the operating characteristics to specified parameters.
<b>Calibrate</b>	To determine corrections and cause them to be made or to make adjustments on instruments or test, measurement and diagnostic equipment (TMDE) used in precision measurement.
<b>Remove/Install</b>	To remove and install the same type of item. Could also occur separately (e.g., modification work order [MWO], installation kit, but nothing removed).
<b>Replace</b>	To remove an unserviceable item and install a serviceable counterpart in its place. (Could refer to fluids, e.g., oil.).
<b>Repair</b>	To perform maintenance required to correct material damage and to restore an item to serviceability standards.

**Figure 1-6. Maintenance Functions**

Title	Description
<b>Overhaul</b>	To restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications.
<b>Rebuild</b>	To restore unserviceable equipment to a like-new condition IAW original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment.

**Figure 1-6. Maintenance Functions (Continued)**

## **SECTION II – MAINTENANCE SUPPORT**

1-18. Maintenance support is a flexible, decentralized operation (maintenance execution) capable of keeping up with shifts in operational tempo. Centralized control (maintenance management) provides maximum resource use to accomplish the mission. The maintenance support concept focuses on sustaining operations by maximizing equipment availability to the force-projection Army. It strives to create a seamless system operating across strategic, operational, and tactical levels, interweaving and mutually supporting all levels of maintenance for maximum effectiveness. Maintenance support requires continuous coordination with customer units to tie the soldier in the field to the national level. The emerging operational concept for maintenance embraces requirements and capabilities in an interlocking scheme of maintenance support from the breakdown site to the CONUS base.

1-19. Operations in peacetime and in combat place heavy demands on equipment. Weapon systems and other equipment are subject to severe use. A tank that will not move is a definite liability to the tactical commander. A radio that does not work can cause a breakdown of communications that could result in the loss of lives. The link between the using organization and maintenance support is a trained operator/crew who can properly use and maintain the equipment. Though time is limited, the continued availability of equipment demands that the operator/crew perform PMCS.

1-20. The cornerstones of maintenance support are the tenets, "fix forward" and "anticipate support." Repairing equipment far forward enhances the ability to quickly return the maximum number of combat systems, at the earliest opportunity, as close to the using unit as possible. Anticipating future requirements allows prepositioning of maintenance support capabilities. Anticipation rests on the ability to foresee future operations and to identify, accumulate, and maintain the assets, capabilities, and information required to support them.



### FORCE XXI AND BEYOND...

**Replace Forward and Repair Rear:** Replacing line-replaceable units or modules instead of attempting to repair them, leveraging advanced prognostics and diagnostics tools, support equipment, and training. The line-replaceable units or modules are then retrograded to higher levels of maintenance for repair and return to the distribution system.

Force XXI field maintenance operations are characterized by lean, modular, and enabled maintenance units focused on maximizing combat power. The velocity at which future field maintenance operations must be performed, Force XXI distributed operations, the capabilities of battlefield distribution, and expected gains in diagnostics and prognostics facilitate our ability to fix equipment forward through replacement of LRUs or component assemblies.

Replace Forward means a soldier performs "on-system" maintenance. "On system" refers to replacing components or subcomponents at the point of repair, the breakdown site, or the UMCP. Maintainers normally diagnose down to the major component failure. They then replace that component and return the system to operational condition. Based on METT-TC, the soldier may diagnose and replace subcomponent items depending on the availability of tools, parts, and time. An example of a replace function is the replacement of a full-up power pack (FUPP). If a serviceable FUPP is available, the maintainer replaces the major assembly. If the FUPP is not available, the maintainer might swap out a serviceable engine from an unserviceable FUPP with a bad transmission.

Repair Rear means that soldiers perform "off-system" maintenance. "Off system" refers to those actions taken to return components and subcomponents of weapon systems to serviceable condition. These repair actions take place at designated places throughout the battlefield. Corps maintenance units may have the capability to repair certain LRUs or assemblies for major weapons systems they support. Corps component repair companies or special repair activities in the corps or theater area repair other components and assemblies as determined by sustainment maintenance managers. An example of a repair function at the corps or theater level is the rebuild of a tank engine or other major assembly.

1-21. Leaders must tailor and position maintenance support to provide quick, mobile responses to changes in units and weapon systems. Maintenance managers must coordinate the best use of available resources to repair and return the maximum number of critical items. They must maintain close, consistent interaction between maintenance organizations and their supply support activities to ensure quick access to repair parts. Support elements must perform maintenance work as far forward as practical within the limitations of METT-TC and the commander's priorities.



#### FORCE XXI AND BEYOND...

**Combined Organizational/Direct Support-Level Maintenance for the Maneuver Task Force:** Unifying organizational- and DS-level maintenance responsibilities and capabilities into one organization, the Division XXI Forward Support Company, to focus maintenance leadership, management, technical expertise, and assets under a single logistics operator. This ensures maintenance can be planned, allocated, and swiftly executed when and where needed in order to satisfy the commander's requirements.

Efficiency in maintenance management and effectiveness of maintenance operations are maximized when organizational- and DS-level maintenance operations are consolidated into one organization. This concept eliminates the loss of time and job continuity associated with the transition of organizational-level job orders to direct support job orders and vice versa. Consolidated maintenance gives maintenance managers the flexibility to dispatch more effective maintenance teams forward because of centralized control over and access to more capability. The concept brings maintenance assets under a single logistics operator for maintenance, the maintenance control officer. It also brings together maintenance leadership and management so that maintenance support is planned, resourced, and executed when and where needed with a unified focus supporting a common mission and objective.

Enablers such as the multicapable maintainer (MCM), forward repair system (FRS), and advanced diagnostics and prognostics give the combat repair teams (CRTs) the ability to execute this concept. The CRTs have the right people with the right tools and test equipment to provide field maintenance forward on the battlefield and rapidly return combat systems to the fight.

1-22. Recovery assets move inoperable equipment to a designated location (unit maintenance collection point) or to a maintenance activity best suited to perform the repair. Maintenance activities may evacuate equipment to another maintenance activity in order to balance the workload of forward elements so that they can meet new requirements.

## METHODS

1-23. The four methods of support used by maintenance organizations are—

- Forward support.
- Area support.
- Backup/Reinforcing support.
- Passback support.

Figure 1-7 gives a brief description of each method.

Method	Description
<b>Forward Support</b>	<ul style="list-style-type: none"><li>• Maintenance oriented toward quick turnaround to the user in order to maximize operational time by minimizing repair and evacuation downtime.</li><li>• End item repair thrust as <i>far forward</i> as possible within tactical time criteria, or recovered and evacuated to the point where repair can be made. "Fix forward" remains the preferred maintenance concept.</li></ul>
<b>Area Support</b>	<ul style="list-style-type: none"><li>• Maintenance resources concentrated in a <i>defined geographic area</i> based on type and quantity of equipment supported.</li><li>• Focus placed on supporting units operating in or moving through defined geographic boundaries.</li></ul>
<b>Backup/Reinforcing Support</b>	<ul style="list-style-type: none"><li>• Customer backup support provided to supported unit for excessive maintenance requirements that cannot be performed due to time or resource limitations.</li></ul>

**Figure 1-7. Description of Support Methods**

Method	Description
<b>Backup/Reinforcing Support (continued)</b>	<ul style="list-style-type: none"> <li>Backup support provided to like maintenance unit for temporary excessive requirements that must be performed to meet operational readiness needs.</li> </ul>
<b>Passback Support</b>	<ul style="list-style-type: none"> <li>Passback support provided by one maintenance unit to a supported maintenance unit. This requirement is a predictable and permanent maintenance workload that is allocated by force structure.</li> </ul>

Figure 1-7. Description of Support Methods (Continued)

## MANAGING BATTLEFIELD MAINTENANCE

1-24. When requirements have been identified, the maintenance manager must identify the resources on hand and those already committed. Available resources are then managed within the established support framework to return the maximum number of items to fully mission-capable status.

1-25. When a shift or change in priorities could provide a greater overall return, the maintenance manager takes appropriate action or makes recommendations through the chain of command. Although a maintenance planner may not formally lay out a management matrix as such, a mental estimate of these factors is necessary. Figure 1-8 shows the basic concept for managing maintenance support on the battlefield.

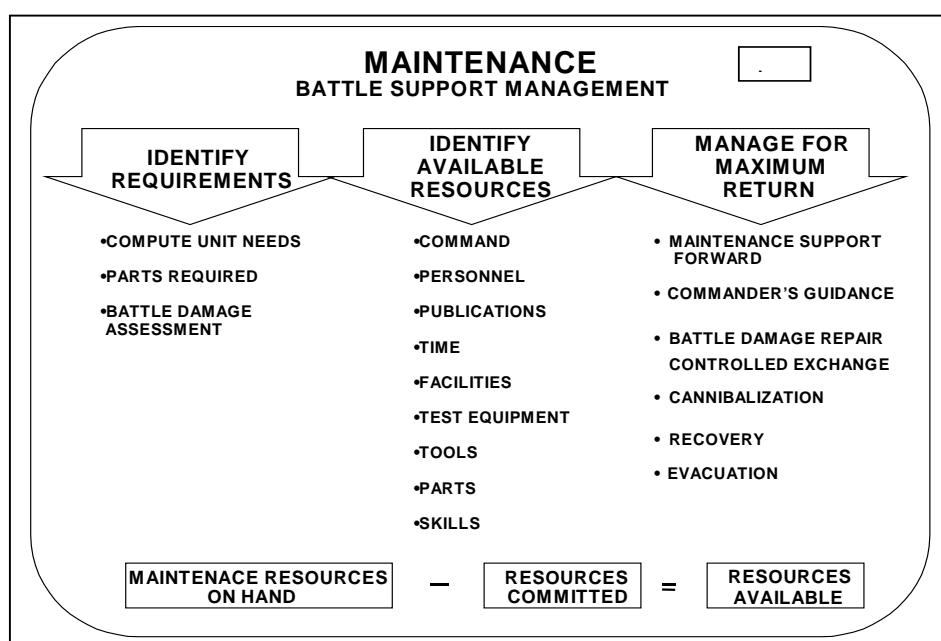


Figure 1-8. Managing Battlefield Maintenance Support

## **BATTLE DAMAGE ASSESSMENT AND REPAIR**

1-26. BDAR is used to inspect damaged equipment to determine the extent of damage, to classify the equipment according to the type of repairs required, and to develop a plan of action for each item. Priorities for repair of battle-damaged systems are as follows:

- Most essential for completion of the immediate mission.
- Can be repaired in the least amount of time.
- Repairable but not in time to continue the immediate mission.

### **NOTE**

Equipment that is damaged beyond repair becomes a candidate for cannibalization.

1-27. BDAR uses emergency expedient repairs, as outlined in BDAR technical manuals, to return the system to fully or partially mission-capable status. Under combat conditions, BDAR may be performed on fueled or armed systems. The commander may also waive other precautions. All operations must be conducted as safely as possible.

## **ORGANIZATIONAL FLEXIBILITY**

1-28. Maintenance managers must be aware of changing support requirements and must tailor maintenance resources to ensure support is provided as required. This tailoring encompasses adding or removing resources, such as personnel and equipment, to meet mission requirements and to best support the tactical commander's intent. Restructuring company maintenance teams (CMTs) or requesting maintenance support team (MST) assistance from supporting maintenance units should be done as required.

## **REPAIRS AND RECOVERY**

1-29. To maximize unit combat readiness, equipment must be repaired and returned to the user as quickly as possible. Repairs should be made as far forward as possible. As equipment in the corps and communications zone (COMMZ) is not always "forward," forward also means on site or at the supported unit's UMCP.

1-30. Recovery of equipment to maintenance collection points removes equipment from using units and increases the time it is not available. Repairing equipment as far forward as possible reduces transportation requirements and non-mission-capable time and increases equipment availability.

1-31. Commanders must ensure that the degree of maintenance performed is consistent with technical and tactical requirements. During combat, only maintenance needed to return equipment to mission-capable status is performed. This concentrates the maintenance effort on those areas that affect the outcome of the battle.

1-32. Non-mission-essential maintenance is deferred until after the battle. Sometimes a weapon or support system may contain redundant systems that enable it to operate even when one or more of them are damaged. Commanders may decide to keep a weapon/support system in the battle at reduced capability rather than lose it entirely while the inoperable system is repaired.

## **CENTRALIZED MANAGEMENT OF DECENTRALIZED OPERATIONS**

1-33. Maintenance managers at all levels must maintain control over their respective maintenance operations even though the support is decentralized. This provides support as far forward as possible and focuses available maintenance resources on the work to be done.

## **MANAGER RESPONSIBILITIES**

1-34. Managers must be aware of both the maintenance workload and available resources in order to make necessary maintenance support decisions. Since the situation may change rapidly, information must be as near real time as possible. Managers must direct the use of maintenance resources or shift the workload to the maintenance elements best suited to make the repair. They should avoid having damaged equipment awaiting repairs in one area of the battlefield while maintenance personnel are idle in another. Managers must create a flexible maintenance environment so that resources and workloads can cross various command boundaries.

## **REPORTING SYSTEMS**

1-35. Accurate reporting is the link between decentralized operations and centralized management. The measure of success of a maintenance manager is based on the ability to manage maintenance operations to maintain desired operational readiness standards. The Unit-Level Logistics System-Ground (ULLS-G) performs The Army Maintenance Management System (TAMMS) functions at the unit maintenance level. The Standard Army Maintenance System (SAMS) provides maintenance managers with an automated management information system that can assist them in managing DS maintenance operations.

1-36. For additional guidance, maintenance managers should refer to Training Circular (TC) 43-4.



### FORCE XXI AND BEYOND...

The Army is currently developing a seamless, interoperable system that consolidates the current stovepipe management information systems. Global Command Support System–Army (GCSS-Army) integrates and standardizes the format for data entry used by current Army systems. GCSS-Army also standardizes communication protocols. GCSS-Army consists of multiple modules that interface with each other. The modules related to ordnance maintenance operations are listed below:

#### **Maintenance Module (MNT):**

GCSS-Army combines the functions of the current ULLS-G, ULLS-A, and SAMS-1 systems into a single maintenance module. This module manages workload and coordinates repair services, provides applicable financial information, reports maintenance status, and performs TAMMS records management. The module will also leverage emerging technologies to support split-base operations and increased mission support requirements. The module has the capability to process Class IX supply requisitions.

#### **Management Module (MGT):**

GCSS-Army will integrate the capabilities currently found in the SARSS-O ILAP, the maintenance management reporting performed by SAMS-2, and the planning and management functions developed for ULLS-S4 (logistics estimates, CSS planning and management-type functions, and unit status reporting). The MGT module will allow users the ability to access required CSS data from a single database and make decisions using that data.

#### **Integrated Management Module (IMM):**

GCSS-Army integrates the functionality of SAAS-Mod, SPBS-R, SARSS-2A, SARSS-2AC, SARSS-B, SARSS-Gateway, and SAMS-2. This integration produces a package of functions for use by sections within materiel management centers at all levels.